ABSTRACT

Thesis: Impact of Impaired Fasting Glucose on Peak Oxygen Pulse

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Peak oxygen pulse (O_2 pulse) is associated with an inverse relationship to coronary heart disease (CHD) and morality and known to be prognostic of health outcomes. Currently little is known about peak O_2 pulse in individuals with impaired fasting glucose (IFG). **Purpose:** To examine the relationship between fasting blood glucose (FBG) and peak O_2 pulse determined by cardiopulmonary exercise testing. **Methods:** A total of 3,687 participants were included from the Ball State Adult fitness Longitudinal Lifestyle STudy (BALL ST) cohort through 2020 (2,616 normal fasting glucose, 901 impaired fasting glucose and 170 diabetic participants based on American Diabetes Association (ADA) FBG criteria). Participants were self-referred and completed health history background, non-exercise testing and cardiopulmonary testing. Peak O_2 pulse between FBG groups was assessed using analysis of covariance (ANCOVA) to control for age. **Results:** Peak O_2 pulse decreased ($P<0.05$) in males from normal fasting glucose (NFG)> IFG> type 2 diabetes mellitus (T2DM) and remained unchanged in females. The group effect ($P=0.003$) and interaction ($P=0.001$). **Conclusion:** Peak O_2 pulse decreasing across FBG status is concerning as O_2 pulse is inversely related to mortality and higher O_2 pulse has a better prognostic value. Type 2 diabetics have two-to-three fold higher risk of cardiovascular events and cardiovascular disease accounts for about 80% of mortality in diabetes (2). Peak O_2 pulse can be used as another tool in CPET to help diagnose IFG and T2DM in males, more research needs to be done comparing the sex differences in females.